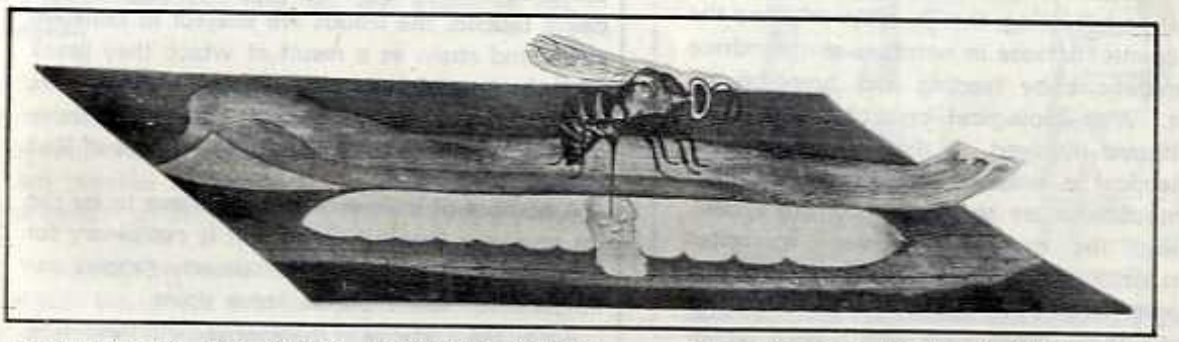
Biological Control of Pests

The major pests on coconut plantations are insects and among them the majority are insects which damage the foliage. Two important steps in insect pest management on coconut are first to lower pest insect populations and then to maintain these populations below economic damage levels. Due to the inherent tallness of the mature coconut palms difficulties are experienced in achieving these objectives. Biological control hence occupies a position of prime importance and is the focal point around which all other control methods revolve.

In agricultural practices of the past, insect control was more or less synonymous with chemical control. However, the continued use of chemicals resulted in the development of strains that were resistant to insecticides. With this an interest in studies on beneficial insects developed and the principle of biological control was born. Biological control applied to insects, is the use of other living organisms (usually other insects) for the control of pest insects. Biological control was practiced in the very ancient times when our forefathers were known to have introduced *Oecophylla* (Dimiya) nests into plantations plagued by pests. But today the concept has acquired greater importance and is practised on highly scientific lines, and forms part of a more broad-based pest control programme. Not only insects, but bacteria, fungi and viruses are also used in biological control. Some of these in use against coconut pests are *Bacillus thuringiensis* (bacterium) for the control of lepidopterous pests, *Metarrhizium anisopliae* (fungus) and *Baculovirus oryctes virus* for the control of the Black Beetle.



Biological control has been very successfully used in the control of coconut pests. The Coconut Research Institute of Sri Lanka can boast of achieving outstanding successes in this field such as in the control of the Coconut Leaf Miner-*Promecotheca cumingi*, which has ceased to be a problem due to the excellent control obtained and maintained through the action of the introduced egg, larval and pupal parasites. The control achieved is so complete that the pest is very rarely seen and whenever observed 50 to 80% parasitisation has also been recorded.

The Coconut Scale *Aspidiotus destructor* is also very effectively kept under control by the naturally occuring predatory lady bird beetles, larval and adult stages of which feed on all stages of the scale.

The Coconut Caterpillar *Opisina arenosella* (Nephantis serinopa) is one of the major pests of coconut in Sri Lanka where biological control is the main control method. A number of larval and pupal parasites are being bred in the laboratories of the Coconut Research Institute for release in Coconut Caterpillar infested estates. After initial investigations by the Institute staff these parasites are issued free of charge to the

needy planters. In severe infestations where parasites do not readily establish, either due to unfavourable weather conditions or due to the presence of hyper-parasites, the spraying of an insecticide may have to be undertaken.

The Nettle Grub of coconut *Parasa lepida* is yet another insect which is kept very effectively under control by the naturally occuring larval and pupal parasites. Most of the other minor pests such as the Bag Worm *Psyche Manath albipes* and the less known pests remain as minor pests or as less known pests very often due to the fact that they are kept under adequate check by the naturally occuring biological control agents which do not allow the pest to develop into severe infestations.

The advantages of biological control over the other methods of control are considerable. Biological control is relatively cheap and easy to apply compared to the other control methods such as insecticide application. Biological cont rol is self perpetuating, that is, once released the control agents increase in numbers and continue their generations by feeding and breeding on the pest. With biological control there is no health hazard involved, in that no injurious or toxic chemical is released into the enviroment. When insecticides are sprayed to control a pest. sometimes, the natural enemies (parasites predators etc.) of the target pest and also the natural enemies of other pests may be killed and as a result these other pests, which were earlier kept under control by their own natural enemies, may now assume infestation proportions and appear as major pests. This danger is never present with biological control nor is there a danger in the development of resistance as is common with insecticide use.

The disadvantages of biological control are that it is relatively slow in producing results, although the results are much longer lasting, and also it can be done only under proper scientific guidance and supervision.

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